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conclusions of physics and chemistry, and, in addition, must devote not a little time and labor to studying the application of the more general laws of these sciences to the special phenomena of plant and animal life. In this text-book the author has summarized briefly the principal conclusions of the inorganic sciences, devoting special attention to those laws on which the higher science of biology is founded, and has endeavored to keep prominently in the foreground the dependence of biology on physics and chemistry, and the relationship of morphological and physiological details to general principles.

Matter, energy, the classification of chemical compounds, and the laws of chemical change, are discussed in the first chapter; and the author then proceeds to consider protoplasm in its many and varied aspects. Individual and tribal life, with distribution and classification, are thoroughly treated.

The *Proteita*, *Protophyta*, *Protozoa*, *Metaphyta*, and *Metazoa* are described in most minute detail. The illustrations are excellent, and are to a great extent original. The typography and general execution of the book leave nothing to be desired. As a text-book of elementary biology, it is one of the best that have ever been published.

Chemical Lecture Notes. By PETER T. AUSTEN. New York, Wiley. 12^o. \$1.

THIS book is not intended as a text-book, but is simply a collection of notes and observations on certain topics, which, experience as a teacher of chemistry in Rutgers College and the New Jersey State Scientific School has shown Professor Austen, give the student more or less trouble. While no attempt has been made to include all the rocks and shoals on which chemical students suffer shipwreck, still the author has succeeded in making lucid many of the topics which are not rendered sufficiently intelligible by the average text-book. Valence, atomicity, the laws of Boyle, Charles, and Mariotte, can no longer be a mystery to a student of these lecture-notes. We recommend them to those who have found difficulty in comprehending the intricacies of modern chemistry, and equally to those who would escape the hard places in this science, so numerous even when studied with the best of helps and teachers.

AMONG THE PUBLISHERS.

WE have received from A. Lovell & Co. "Greene's Language Half-Blanks, No. 1," by H. R. Greene, a pamphlet designed to teach the elements of English grammar by means of exercises and diagrams. Examples are given of the parts of speech, and the construction of the sentence is duly explained, and the pupil is then to write short sentences, the principal words being furnished him to illustrate what has been told him. These sentences are to be arranged in tables, and the different elements of the sentence indicated by certain marks written under the words. What the precise value of Mr. Greene's system may be, experience must decide; but marks and diagrams have no connection with language as such, and can at best be nothing more than very slight helps. The book is one of a series ending with a full grammar.

— Messrs. Ginn & Co. of Boston have issued "An Introduction to the Poetry of Robert Browning," by Professor William J. Alexander of Halifax, N.S. The author remarks on the difficulty experienced in understanding any new writer, and on the special difficulty of understanding Browning because of his obscurity; and he has prepared this work with the object of clearing up some of these difficulties, and making his author more comprehensible to the mass of readers. He finds the chief motive of Browning's work in his belief in the central doctrines of Christianity, which he has endeavored to illustrate and enforce. One chapter is given to Browning's philosophy, and another to his theory of art; and the remainder of the book is devoted to an account of his mental development as exhibited in his various works.

— D. Appleton & Co. will publish immediately a treatise by the Hon. Seymour Dexter of Elmira, N.Y., on "Co-operative Savings and Loan Associations," which will include an examination of building and loan associations, mutual savings and loan associations, accumulating fund associations, co-operative banks, etc.

The appendix will contain laws of New York, Pennsylvania, and Massachusetts, forms for Articles of associations, by-laws, account-books, and other useful information on the subject. The author, who is judge probate of Chemung County, has been president of the Chemung Valley Mutual Association for fourteen years, and is high authority on the subject of which he treats. They also announce "A Manual of Instruction in the Principles of Prompt Aid to the Injured," designed for military and civil use, by Dr. Alvah H. Doty; and a new book by Mr. O. B. Bunce, entitled "The Story of Happinolande and other Legends," which is to be issued in the Gainsborough Series. The latter consists of four slight sketches, — "The Story of Happinolande" (which, being translated, is "Happy-no-land"), "A Millionnaire's Millions," "The City Beautiful," and "John's Attic;" all of which, the latter, however, only slightly, involve questions in social science.

— Harper & Brothers have ready this week a concise instructive work on "Constitutional Government in Spain," by J. L. M. Curry, LL.D., predecessor of Mr. Perry Belmont as minister of the United States in Spain. It is the result of some years of close study of the subject, and of actual observation of Spanish political and social life during the author's official residence in the country. Valuable appendices are added, summarizing the careers of aspirants to the Spanish throne, — Fernando, Leopold, Duke of Montpensier, and Amadeo; giving sketches of Christina, Isabel, Alfonso XII., the Infantas, the Queen Regent, and Alfonso XIII.; describing the present condition of Spain in its political, social, and industrial aspects; and, lastly, explaining briefly the acquisition of Florida by the United States. They have also just ready "Choice Cookery," by Catherine Owen, author of "Ten Dollars Enough," etc., the object of which is to help those who wish to know at a glance what is newest and best in modern cookery.

— David McKay, Philadelphia, will shortly publish a new edition of Joel Cook's "Holiday Tour in Europe," formerly published by Porter & Coates.

— The *American Magazine* suspended publication last December.

— *The Index*, published by E. R. Walker, Chicago, is a little four-page monthly paper that will attempt to take "a glance at the leading features of the forthcoming periodicals."

— *Once a Week* has been enlarged, and includes a greater variety of contents. The most noticeable thing in the current number is the first instalment of a Stockton story, called after its heroine, "Ardis Claverden."

— *The Advance Sheet*, published by C. A. Watson, New York, will attempt to give a monthly survey of periodical literature, indexing the contents of the leading periodicals for the next month, with such comments as will make the announcements as attractive as possible.

— The two new volumes of "Letters of Carlyle" which Professor C. E. Norton has edited are mostly addressed to the various members of Carlyle's family, and afford a tolerably continuous account of his life from his marriage to the period when his fame was about to be established by the publication of his "French Revolution." Messrs. Macmillan are to publish them speedily.

— The new edition of Queen & Co.'s "Chemical Apparatus Catalogue" is now published. It contains 368 pages, with about 1,200 illustrations, and will be mailed to any address on receipt of fifty cents, which sum will be deducted from the first purchase made from it amounting to ten dollars or more. This is a very elaborate work, containing the most useful apparatus, and the firm feels confident that it will be considered by chemists a standard for reference. While the quality of the apparatus is maintained, most of the prices have been reduced.

— In the *Contemporary Review* for March (New York, Leonard Scott Publication Company), interest centres in the paper on the "Panama Canal," by Edward Whymper, with its intelligent diagrams and maps; Archibald Forbes criticises some of Lord Wolseley's recent utterances; Dr. Dale continues his interesting papers on Australia; Canon Wilberforce treats of Ireland's demands; and Mr. Clerke describes the observatory at the Cape of Good Hope.

— The favorable reception accorded in the past to the Easter-card packets put up by H. H. Carter & Co., Boston, has encouraged this enterprising house to prepare their 1889 packages with even greater care than heretofore. Being one of the largest dealers in this class of goods in the country, and selling paper directly from the mills, they are enabled to give exceptionally good values. People dealing with them are sure to find their goods satisfactory.

— Contortionists and "Snake-men" will be described in the April *Scribner* by Dr. Thomas Dwight of the Harvard Medical School, who has made a thorough investigation of their peculiar anatomy. Photographs of several expert contortionists in their most wonderful feats will be reproduced in the article. Henrik Ibsen, the Norwegian dramatist, a literary genius little known in this country, is the subject of a paper in the same number. Charles Francis Adams's paper on "The Prevention of Railway Strikes" was written nearly three years ago, but held back by the author for fear that, in existing conditions, it might result in more harm than good. A practical scheme for giving employees a part in the management of the road is suggested. Pictures showing stages in the building of the great ocean steamers, the "City of New York" and others, will illustrate Mr. Rideing's article on "Ocean Greyhounds."

— At a regular meeting of the Nineteenth Century Club, New York, on the 9th of November last, a resolution was passed appointing a committee to prepare and publish a memorial volume to the founder and first president of the club, and to solicit subscriptions to defray the expenses. This volume is now ready for publication. The book will contain the funeral orations, the addresses delivered at the memorial meetings, and essays and letters since received. It will consist of about two hundred pages, octavo, printed on heavy Holland paper, and richly bound in levant morocco. This edition, upon which no pains or expense will be spared to make it worthy of the club and of the occasion, will cost five dollars per copy. For those who desire it, an edition, handsomely bound in cloth, will be supplied at a cost of three dollars per copy. As frontispiece there will be a portrait of Courtlandt Palmer. As the committee have decided to print only such copies of the memorial volume as are ordered in advance, it is desirable that no time should be lost in notifying John H. Beach, 25 East 57th Street, of the number of copies and the kind of binding which may be desired.

— Mr. Andrew Lang is a frequent contributor of leading articles on social and literary topics to the *London Daily News*; and some of his admirers think that not a little of his most characteristic writing is to be found in these "leaders," as the English call them. One of these admirers, with the author's permission, has gathered some thirty of these essaylets in a volume which Longmans, Green, & Co. will publish shortly, under the apt title of "Lost Leaders." Among the subjects treated are "Thackeray's Drawings," the "Art of Dining," "Phiz," "Amateur Authors," and the "Lending of Books."

— James W. Queen & Co., 924 Chestnut Street, Philadelphia, announce a clearance sale of microscopes, objectives, accessories, and sundries, and have issued a new catalogue. The firm's stock-taking strongly calls attention to the fact that some microscopical accessories (and other goods) have not shown, of late, such activity of commercial movement as is desirable. They have therefore picked them out, described them in their special catalogue, and cut the prices, to make them move along. The articles described in this list are new and perfect unless otherwise noted.

— The following are from the table of contents of the April number of *The Chautauquan*: "Gossip about Greece," by J. P. Mahaffy, M.A., of Dublin University; "Agesilaus," by Thomas D. Seymour, M.A., of Yale University; "Greek Art," by Clarence Cook; "Color in the Animal World," by the Rev. J. G. Wood; "What Inventors have done for Farming," by James K. Reeve; "The Care of the Insane," by A. G. Warner, Ph.D.; "Sunday Labor," by the Rev. Jesse H. Jones; "The First Presidential Inauguration," by Charles Carleton Coffin; "English Pronunciation," by Robert McLean Cumnock, of Northwestern University; "Stu-

dent Life in Paris," by F. M. Warren; "British Columbia," by Sheldon Jackson, D.D., United States general agent of education in Alaska; "Women's Clubs in London," by Susan Hayes Ward; "A Virginia Plantation," by C. W. Coleman; "The Secret Service of the Treasury Department," by Mrs. Carl Barus.

LETTERS TO THE EDITOR.

* * * Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith. The editor will be glad to publish any queries consonant with the character of the journal. Twenty copies of the number containing his communication will be furnished free to any correspondent on request.

Origin of Fish in Isolated Waters.

A FEW months ago I called attention to the abundance of fish in certain isolated ponds in Florida, which become dry at times. (*Science*, xii. p. 280). Mr. Henry W. Howe of Boston suggested in reply that fish may be transported from one pond to another by birds. This is an interesting suggestion, as indicating a possible explanation, though I am not aware that there is any evidence to that effect at present. Alligators might also be mentioned as a possible transporting agency. But any such means would seem to be inadequate to produce the observed results. Since my former communication, I have had further opportunity to investigate this subject. The past season in Florida has been a very unusual one. The rainy season, which usually begins in the peninsular portion of the State, about the 1st of June, failed to make its appearance, and a severe drought resulted. Ponds, swamps, creeks, and wells became dry. Then in the fall, when the rainy season usually closes, "the windows of heaven were opened," and a very wet fall and winter followed. But the ponds, which were dry for many weeks during the hottest part of the year, now swarm with little fish; and during the heavy rains fish could be seen not only in ponds, but in ditches beside the railroad, in ditches beside the fields, and in shallow rain pools which would dry in a few days, and had no connection with other waters. In fact, minnows have been almost abundant enough to give color to the old notion of the *raining-down* of fish, frogs, tom-cats, lean meat, etc., reports of which are occasionally seen in the newspapers. There is certainly some certain and rapid means of populating the waters of isolated and temporary pools, which is well worth investigating.

CHS. B. PALMER.

Orange Heights, Fla., March 11.

The Soaring of Birds.

I HOPE I may be allowed space for a few short comments on Messrs. Gilbert and Kimball's letters in *Science*, xiii. pp. 169 and 170.

My conception of relative velocity does not differ from Mr. Gilbert's, as he supposes, and accordingly the statements of his paper were as clear to me as the restatements of his letter. So far as his presentation of the differential motion theory of soaring is concerned, my only criticism was that his assumption as to the dynamical effect of the wind on the bird during the turn seemed to demand more than mere assertion. One of my statements as to what this assumption implied, Mr. Gilbert questions as follows: "I do not admit 'that during the turn his [the bird's] velocity relative to the earth will change by an amount equal to twice the velocity, relative to the earth, of the medium in which the turn is made.' His velocity relative to the earth will change by an amount equal to twice his velocity relative to the medium." Both positions are correct, however. We are merely using the term "velocity" in different senses,—Mr. Gilbert as connoting both rate and direction of motion, I as connoting rate of motion simply. I used the term in this sense, because it was the sense in which Mr. Gilbert had used it when he asserted that the velocity of the bird relative to the air would be the same after a turn as before.

Both Mr. Gilbert and Dr. Kimball hold that the velocity of wind or bird relative to the earth "has nothing to do with the question." That surely depends, however, upon what the question is. If we undertake, as I did, to account for the fact that some birds are able, without flapping of wings, to describe paths which, *relatively to the earth*, are spirals about lines inclined upwards, velocities relative to the earth must be taken into consideration. If, how-